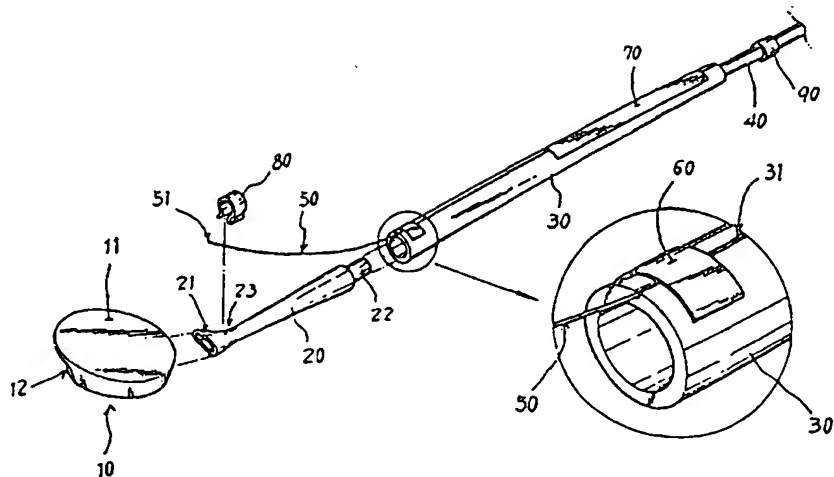




## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(21) International Application Number: PCT/KR98/00262 (22) International Filing Date: 28 August 1998 (28.08.98) (71) Applicant: MIRAE T & G CO., LTD. [KR/KR]; 4F Dongwon B/D, 977-8, Daeyeon-1dong, Nam-ku, Pusan 608-021 (KR). (72) Inventor: LEE, Wangkeon; Kukdong Apt., 101-1802, Hak-jang-dong, Sasang-ku, Pusan 617-020 (KR). (74) Agent: LEE, Joongseop; 1Ga-4, Bumin-dong, Seo-ku, Pusan 602-071 (KR).		(81) Designated States: AL, AU, BA, BB, BG, BR, CA, CN, CU, CZ, EE, GE, HU, ID, IL, IS, KP, LC, LK, LR, LT, LV, MG, MK, MN, MX, NO, NZ, PL, RO, SG, SI, SK, SL, TR, TT, UA, UZ, VN, YU, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).  <b>Published</b> <i>With international search report.</i>

(54) Title: DENTAL SUCTION MIRROR



## (57) Abstract

A dental suction mirror including: a stainless reflecting plate (10) having a slant depression (12) in the front portion thereof, an oblong groove (13) in the rear portion thereof and three holes having different paths in the inner center and on both sides thereof; a stainless connection tube (20) having an expanding portion (21) in the fore portion thereof and a projecting tube in the rear portion thereof; and a handle tube (30) having an insertion groove along the upper part thereof so as to connect the stainless reflecting plate (10) and the stainless connection tube (20), an optical fiber (50) being inserted into the insertion groove (31), stickers being applied to the groove so as to prevent the optical fiber from being getting out of the groove, a plastic clip (80) being inserted into a narrow portion (23) of the stainless tube (20) so as to make the optical fiber being affixed curving slightly upwards over a polished specular surface, and the stainless reflecting plate (10), the stainless connection tube (20) and the handle tube (30) which are coated with nickel-chrome and additionally SiO<sub>2</sub>.

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## DENTAL SUCTION MIRROR

### BACKGROUND OF THE INVENTION

#### Field of the Invention

The present invention relates to a dental suction mirror and, more particularly, to a dental suction mirror which is to efficiently suck blood, saliva, cleaning water and antiseptic solution as well as sucked scraps, having an optical fiber to brighten inside the patient's mouth, a slant surface to prevent the decrease of its suction efficiency and prevent the skin of the mouth from being sucked into the holes thereof, and a stainless connection tube for economical sterilization and replacement.

#### Discussion of Related Art

When a dentist gives a patient a dental treatment such as extracting a tooth, there is inevitably discharge a lot of blood and saliva through the gums in the patient's mouth. The blood and saliva standing in the patient's mouth hinders the dentist in his dental treatment. Therefore, the dentist has to check up the teeth and gums of the patient. With a suction mirror during a dental treatment.

With this, however, the dentist cannot hold a suction hose for sucking in

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and discharging blood, saliva, cleaning water or antiseptic solution standing in the patients mouth, because he has to hold the suction mirror by one hand and a dental tool by the other hand. For that reason, at least one practical nurse to assist the dentist is needed in discharging the blood and saliva in the patient's mouth with the suction hose.

Therefore, there are caused a lot of problems as follows. If the nurse does not work hand in hand with the dentist in discharging the blood, saliva, cleaning water and antiseptic solution standing in the patient's mouth, a successful treatment for the patient is hard to attain due to undesired blood and saliva in the patient's mouth and a longer time required for the treatment.

Furthermore, the nurse can make mistakes in assisting the dentist and spoil the patient's dress with the blood and saliva flowing out of the patient's mouth, because it is difficult for the nurse to place the suction hose in an adequate position of the patient's mouth when the dentist looking into the mouth obstructs the view of the nurse.

In addition to the problems as described above, the space for the dental treatment in the patient's mouth gets relatively smaller due to the suction mirror, dental tools and the suction hose introduced in the mouth during the treatment, which suffers the patient who has to reluctantly open his mouth much wide in front of the dentist for a long time.

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FIGS. 8, 9 and 10 illustrate a conventional suction mirror to solve the above problems. In the suction mirror, as shown in FIG. 8, a disklike stainless reflecting plate 100 having a polished specular surface 101 is welded to a handle tube 109. In the rear part of the handle tube 109, a screw tube 110 is provided to be inserted into a suction hose 200.

Inside the stainless reflecting plate 100, there are provided a hole 102 piercing to the handle tube 109 and an aperture 105 formed rectangularly to the hole in the center of the hole 102. On both sides of the hole 102, holes 103 and 104 are further formed slantly towards the central aperture 105. The respective three holes 102, 103 and 104 have apertures rectangularly formed on the fore parts thereof.

However, the above constructed dental suction mirror involves some problems in that the sucked materials are caught in the complex structure where the two bilateral holes 103 and 104 meet at the point of the central aperture 105 formed on the hole 102 piercing to the handle tube 109. Dental calculus, tooth pieces and plaster fragments (which is used in a dental pretreatment) are hard to discharge through the handle tube 109 of the conventional suction mirror, because they are sucked through the three holes 102, 103 and 104 and the four aperture 105 through 108, and gathered at the edge of the central aperture 105.

Due to the poor suction performance in the prior art, it is required to

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frequently displace the suction hose 200 from the handle tube 109 so as to open through the closed holes, which takes too much time.

Moreover, because the holes 102, 103 and 104 are formed rectangularly to the vertical surface of the stainless reflecting plate 100, the outer edges of them often get in contact with the skin in the patient's mouth, and thereby resulting small diameter of the holes lowers the suction efficiency of the suction mirror.

The conventional dental suction mirror whose whole surface is coated with nickel-chrome is not good for the patient's health. It has no light equipment for brightening the inside of the patient's mouth, which results in the difficulty in a precise treatment for the patient.

The suction mirror of the prior art additionally exhibits the disadvantages in that the handle tube 109 has to inconveniently be taken off from the suction hose 200 every time for sterilization of it and the suction power is weakened due to too many holes formed thereon. Moreover, it is required to replace the whole apparatus when a new suction mirror is to be used.

## SUMMARY OF THE INVENTION

Accordingly, the present invention is directed to a dental suction mirror that substantially obviates one or more of the problems due to limitations and disadvantages of the related art.

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An object of the present invention is to provide a dental suction mirror, which is to efficiently suck blood, saliva, cleaning water and antiseptic solution as well as sucked scraps, having an optical fiber to brighten inside the patient's mouth, a slant surface to prevent the decrease of its suction efficiency and prevent the skin of the mouth from being sucked into the holes thereof, and a stainless connection tube for economical sterilization and replacement.

Additional features and advantages of the invention will be set forth in the description which follows, and in part will be apparent from the description, or may be learned by practice of the invention. The objectives and other advantages of the invention will be realized and attained by the structure particularly pointed out in the written description and claims hereof as well as the appended drawings.

To achieve these and other advantages and in accordance with the purpose of the present invention, as embodied and broadly described, A dental suction mirror comprising: a stainless reflecting plate having a slant depression in the front portion thereof, an oblong groove 13 in the rear portion thereof and three holes having different paths in the inner center and on both sides thereof; a stainless connection tube having an expanding portion 21 in the fore portion thereof and a projecting tube in the rear portion thereof; and a handle tube having an insertion groove along the upper part thereof so as to connect the

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stainless reflecting plate and the stainless connection tube, an optical fiber being inserted into the insertion groove, stickers being applied to the groove so as to prevent the optical fiber from being getting out of the groove, a plastic clip being inserted into a narrow portion of the stainless tube so as to make the optical fiber being affixed curving slightly upwards over a polished specular surface, and the stainless reflecting plate, the stainless connection tube 20 and the handle tube which are coated with nickel-chrome and additionally  $\text{SiO}_2$ .

It is to be understood that both the foregoing general description and the following detailed description are exemplary and explanatory and are intended to provide further explanation of the invention as claimed.

#### BRIEF DESCRIPTION OF THE ATTACHED DRAWINGS

The accompanying drawings, which are included to provide a further understanding of the invention and are incorporated in and constitute a part of this specification, illustrate embodiments of the invention and together with the description serve to explain the principles of the invention:

In the drawings:

FIG. 1 is a fragmentary perspective view of the present invention;

FIG. 2 is a front view of the present invention;

FIG. 3 is a partial expanded sectional view of the present invention;



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FIG. 4 is a cross-sectional view showing the internal construction of the stainless reflecting plate in accordance with the present invention;

FIGS. 5 and 6 are left and right side view of the stainless reflecting plate in accordance with the present invention;

FIG. 7 is a perspective view showing the bottom surface of the stainless reflecting plate in accordance with the present invention;

FIG. 8 is a perspective view of the conventional suction mirror; and

FIGS. 9 and 10 are views showing the construction of the conventional suction mirror.

#### DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

Reference will now be made in detail to the preferred embodiments of the present invention, examples of which are illustrated in the accompanying drawings.

Referring to FIG. 1, in the present invention, holes 14, 15 and 16 piercing the inside of a stainless reflecting plate 10 make different paths to the stainless reflecting plate 10 without meeting together at the centering point. Therefore, the scraps passing through the holes can be successfully discharged through a stainless connection tube 20 and a handle tube 30 without gathering, which serves the time required for reluctantly opening through the holes.

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The area of the holes' outer end portions which contact the skin of a patient's mouth is small because a slant depression 12 is made in the front side of the stainless plate 10 and the holes are pierced thereto, which solves the problem of the prior art that the skin of the mouth is sucked into the holes during suction.

Additionally, the suction efficiency can be secured because the outer end portions of the holes are getting apart from the skin inside the patient's mouth as the diameters of the holes get larger in an oblong form due to the slant depression 12. Therefore, it is useful for sucking and discharging a long scraps in the mouth under dental treatment.

The present invention is also effective in maintaining the suction efficiency to rapidly discharge blood, saliva, cleaning water and antiseptic solution owing to small number of the holes provided in the suction mirror.

The stainless connection tube 20 is inserted between the stainless reflecting plate 10 and the handle tube 30. Thus, it is convenient for sterilization of the stainless reflecting plate 10 and the stainless connection tube 30 by simply taking the stainless connection tube 20 off from the handling tube 30 after separating the plastic clip 80. Economically, the handle tube 30 is not needed to be sterilized.

An optical fiber 50 is inserted into an optical fiber's insertion groove 31

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of the handle tube 30 and an optical fiber's end portion 51 is made to be curved slightly upwards over a polished specular surface 11. Because the plastic clip 80 is inserted into a narrow part 23 of the stainless connection tube 20, the optical fiber's end portion 51 is curved slightly upwards. Thus, the optical fiber's end portion 51 under the light emitted by a luminous body brightens the dark inside of the patient's mouth.

In FIG. 2, the rear part of the optical fiber is desirably affixed to a suction hose with a plastic ring 90, more preferably, with several plastic rings. If necessary, it is preferable to use a vinyl tape.

According to the present, it has no harm to a human health because all components are coated with nickel-chrome and additionally with  $\text{SiO}_2$  thereon. When a new device is to be used, economically we have only to replace the stainless plate 10 and the stainless connection tube 20. Further, a thin mirror can be provided on the upper surface of the stainless reflecting plate 10.

It will be apparent to those skilled in the art that various modifications and variations can be made in the dental suction mirror of the present invention without departing from the spirit or scope of the invention. Thus, it is intended that the present invention cover the modifications and variations of this invention provided they come within the scope of the appended claims and their equivalents.

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What is claimed is:

1. A dental suction mirror comprising:

a stainless reflecting plate having a slant depression in the front portion thereof, an oblong groove 13 in the rear portion thereof and three holes having different paths in the inner center and on both sides thereof;

a stainless connection tube having an expanding portion 21 in the fore portion thereof and a projecting tube in the rear portion thereof; and

a handle tube having an insertion groove along the upper part thereof so as to connect the stainless reflecting plate and the stainless connection tube, an optical fiber being inserted into the insertion groove, stickers being applied to the groove so as to prevent the optical fiber from being getting out of the groove, a plastic clip being inserted into a narrow portion of the stainless tube so as to make the optical fiber being affixed curving slightly upwards over a polished specular surface, and

the stainless reflecting plate, the stainless connection tube 20 and the handle tube which are coated with nickel-chrome and additionally  $\text{SiO}_2$ .

2. The dental suction mirror as defined in claim 1, wherein the stainless reflecting plate is provided with a thin mirror on the upper surface thereof.

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FIG. 1

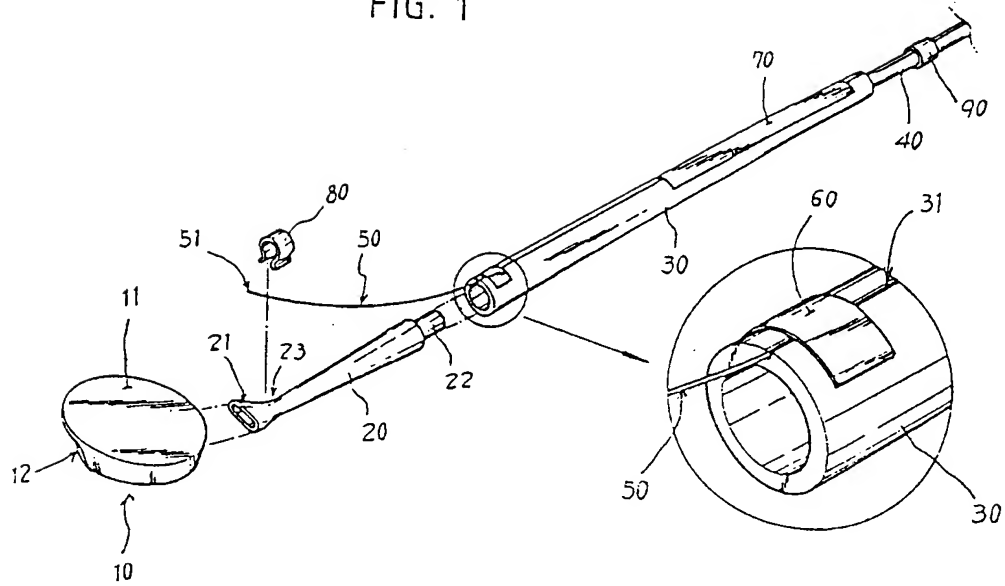
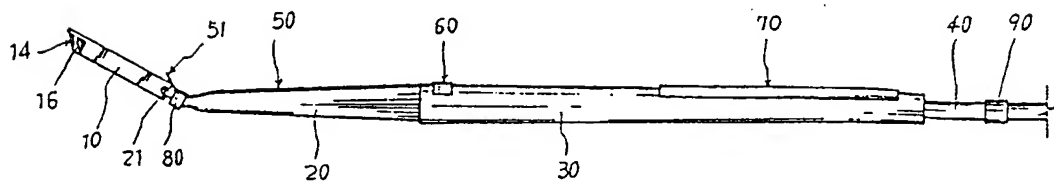


FIG. 2



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FIG. 3

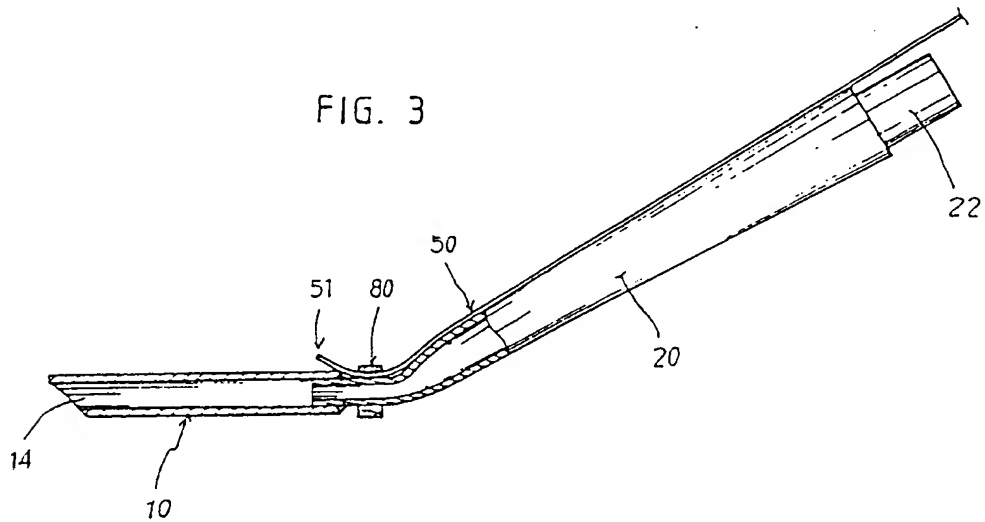
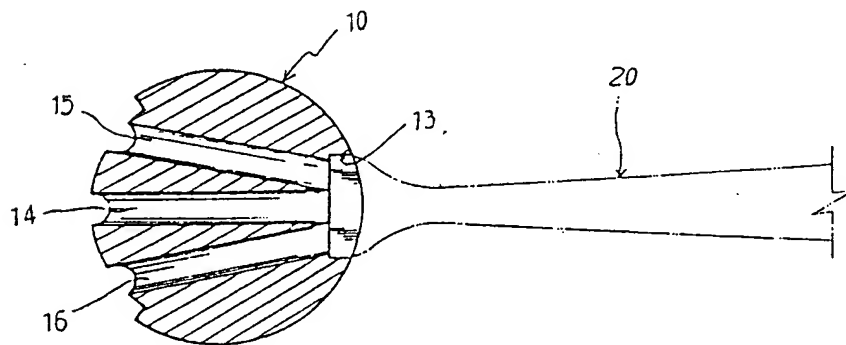


FIG. 4



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FIG. 5

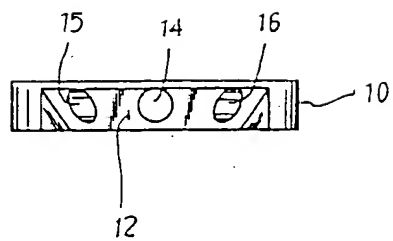


FIG. 6

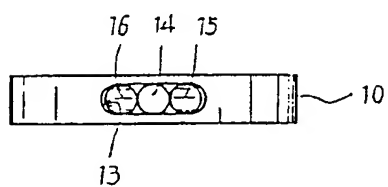
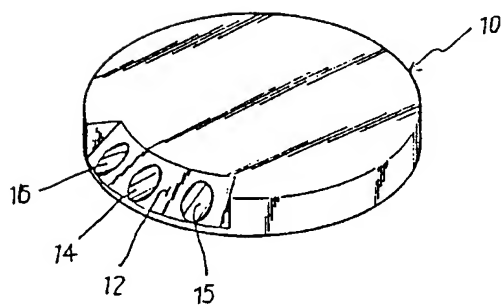
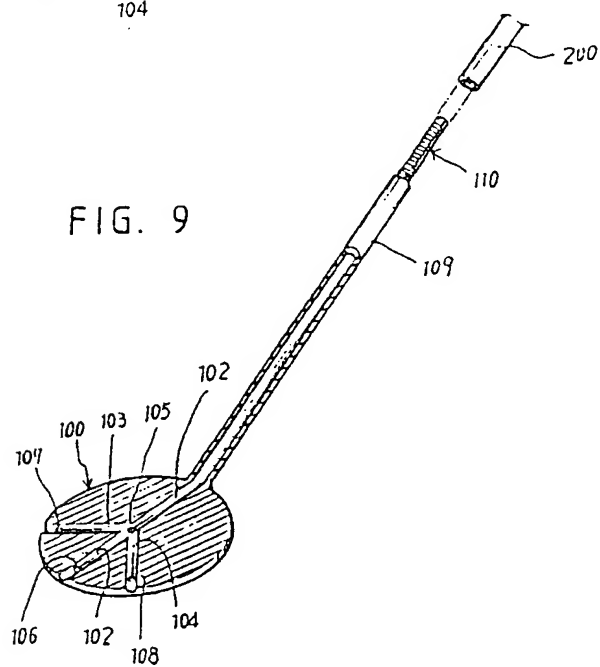
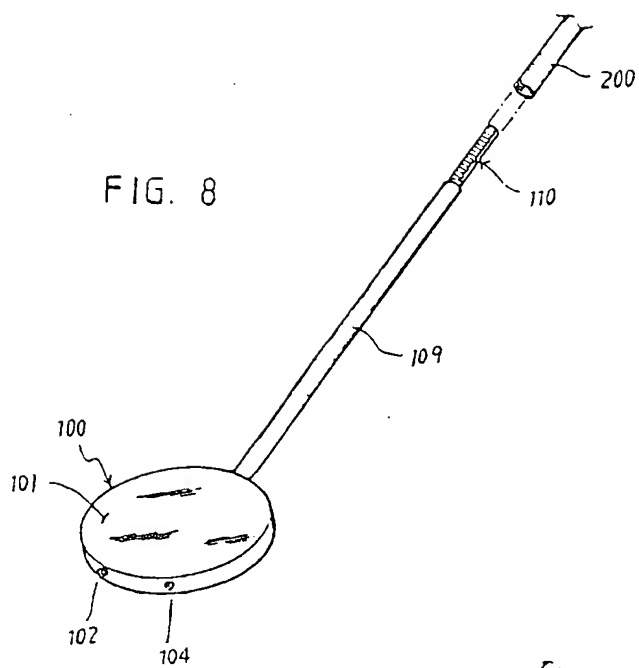


FIG. 7



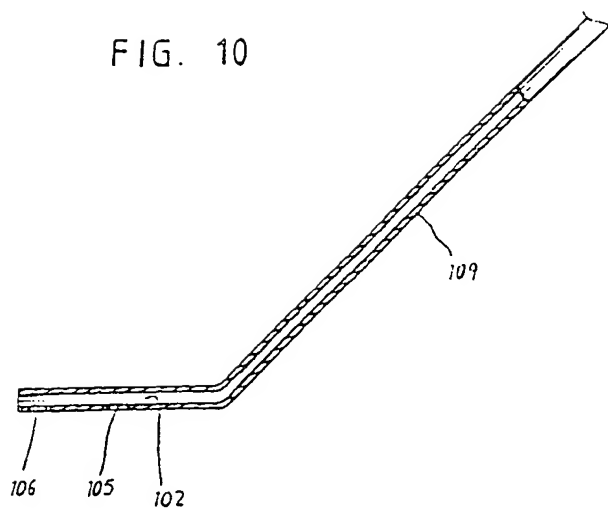
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FIG. 10



# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/KR 98/00262

A. CLASSIFICATION OF SUBJECT MATTER		
IPC <sup>6</sup> : A 61 C 17/06, A 61 B 1/24		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols)		
IPC <sup>6</sup> : A 61 B, A 61 C		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
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C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 281 134 A (SCHULTZ) 25 January 1994 (25.01.94), totality.	1,2
A	US 5 230 622 A (BROSSOIT) 27 July 1993 (27.06.93), totality.	1,2
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22 April 1999 (22.04.99)		30 April 1999 (30.04.99)
Name and mailing address of the ISA/AT Austrian Patent Office Kohlmarkt 8-10; A-1014 Vienna Facsimile No. 1/53424/535		Authorized officer  Beck  Telephone No. 1/53424/134

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International application No.

PCT/KR 98/00262

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US A 5281134	25-01-1994	keine - none - rien	
US A 5230622	27-07-1993	keine - none - rien	